

2004 GALVESTON BAY INVASIVE SPECIES RISK ASSESSMENT
INVASIVE SPECIES SUMMARY

Created by: Environmental Institute of Houston, University of Houston-Clear Lake
and the Houston Advanced Research Center

Common Name: Rio Grande cichlid, Texas cichlid, Rio Grande perch, mojarra de Norte
Latin Name: <i>Cichlasoma cyanoguttatum</i> (Syn <i>Cichlasoma pavonaceum</i> , <i>C. laurae</i> , and <i>Herichthys cyanoguttatus</i>)
Category: Aquatic Animal
Place of Origin: Tropical and subtropical America. "Northeast Mexico and southern Texas, on the Atlantic Coast from the Río Conchos to the Río Grande basin. Native Texas range limited to the Nueces and Rio Grande drainages (Hubbs et al. 1978). Distribution maps (incomplete) given in Lee et al. (1980 et seq.), Conkel (1993), and Page and Burr (1991) (http://nas.er.usgs.gov/fishes/accounts/cichlida/ci_cyano.html)."
Place of Introduction: "It has been widely introduced and reported as established in the Rio Frio, Colorado, San Antonio, San Marcos, Guadalupe, and Comal rivers in the Edwards Plateau region of central Texas (Brown 1953; Hubbs et al. 1978; USGS) (http://nas.er.usgs.gov/fishes/accounts/cichlida/ci_cyano.html)."
Date of Introduction: Most heavily purposefully introduced since mid-1900s to present
Life History: "The Rio Grande cichlid is a pair-forming substrate brooder (Itzkowitz and Niby, 1982). Rocks are preferred as a substrate for spawning. When rocks are scarce, this may limit the number of breeding pairs. Territorial defense does not appear to begin prior to mating, but instead begins after pair formation. Both parents are active in guarding the eggs and fry. Males, however, appear to spend more time patrolling the pair's territory, whereas females spend more time near the young, and are also more aggressive. Although breeding pairs will attack most other fishes in the vicinity of the nest, attacks are more pronounced against conspecifics. Spawning has been reported from March to August, with peak reproductive activity in April (Lee et al., 1980) (http://www.gsmfc.org/nis/nis/Cichlasoma_cyanoguttatum.html)."
Growth/Size: 30 cm
Feeding Habits/Diet: "The diet of this species has been found to vary among the different populations studied. Fish range from detritivorous, to exclusively herbivorous to omnivorous. It has been speculated that such variation results from competition with Centrarchids for limited resources (Lee et al., 1980) (http://www.gsmfc.org/nis/nis/Cichlasoma_cyanoguttatum.html)."
Habitat: "Temperature Tolerance: <i>C. cyanoguttatum</i> is one of most tolerant of cichlids to colder temperatures. Hubbs (in Lee et al., 1980) reported a lower temperature tolerance of 14 °C for fish at Colorado River in Austin, Texas. Under experimental conditions, Shafland and Pestrak (1982), reported a lower lethal temperature of 5 °C for this species. Based on this estimate they concluded that temperature would not be a limiting factor for the extension of this species range throughout Florida (http://www.gsmfc.org/nis/nis/Cichlasoma_cyanoguttatum.html)."
Attitude (aggressive, etc.): "Courtenay et al. (1974) noted competition with Centrarchids for nesting areas, in Polk county, Florida. As is the case with other exotic cichlids, the Rio Grande cichlid probably alters the structure of fish communities where abundant, through aggressive interactions and/or direct competition for resources. There have been reports of variation in the trophic ecology of this species, which were tentatively attributed to competition with Centrarchids for resources (Lee et al., 1980). Although established for many years in Florida it has not become very abundant over most of its range. Thus, it appears to have had less of an impact than some other cichlids, such as the blue tilapia or the Mozambique tilapia. Its impact in non-native localities of Texas is very difficult to assess, because of the lack of information available from these areas, prior to its introduction. In Louisiana this species is becoming extremely numerous among the canals of New Orleans that drain into the southern end of Lake Ponchartrain, where it is rapidly displacing other species (Cashner and Humphries, pers. comm.).
Current Status of this Species in the Gulf of Mexico Ecosystem: The Rio Grande cichlid was introduced into portions of Texas and Florida as a food fish and through accidental releases from fish farms. It was the first cichlid to become established in Florida over 40 years ago (Burgess in Shafland, 1996). It remains abundant at Six-Mile creek, the locality at which it was first reported in, as well as in other localities in Hillsborough county and Big Pine Key (Courtenay et al., 1974; Shafland, 1996). It was also reported as abundant in an abandoned phosphate pit near Mulberry in Polk county (Courtenay et al., 1974). There appears to be a great deal of suitable habitat in southern Florida for the Rio Grande cichlid to expand its range, however it has not, and the reasons remain unclear (Shafland, 1996). Verifiable archival records from New Orleans were first made in the summer of 1996. However, based on interviews with local fishermen, was present in number perhaps several years before that, presumably the result of an aquarium release. It may now have entered bayous in the extensive wetland ecosystems to the south and east of New Orleans (Cashner and

Humphries, pers. comm.).

This species naturally occurs in the lower reaches of the Rio Grande drainage, in Texas. However, it has been extensively introduced into other parts of Texas as a potential food fish. It was introduced into the Guadalupe River Basin, in 1928 by the U.S. Fish Culture Station at San Marcos (Brown, 1953). Hubbs, et al. (1978), reported it as abundant in the San Antonio River, San Antonio, Texas (http://www.gsmfc.org/nis/nis/Cichlasoma_cyanoguttatum.html).”

Physical Description: “According to Page and Burr (1991), the Rio Grande cichlid can be distinguished by the presence of 4-6 dark blotches along its flanks, numerous small white to blue spots along its sides, and a black blotch on its caudal peduncle. Adults have iridescent blue to green spots or wavy lines on their head, body and fins. Breeding adults have their head and anterior trunk colored white, and a dark trunk posterior. Breeding males have a prominent nuchal hump. The fin counts are: 15-17 dorsal spines and 10-12 dorsal rays; 5-7 anal spines and 9-10 anal rays (http://www.gsmfc.org/nis/nis/Cichlasoma_cyanoguttatum.html).”

Management Recommendations / Control Strategies: include references for existing site-specific strategies

“Recommendations: Additional study of this species is urgently needed to understand conditions that seem to afford this species tremendous scope for expansion in Louisiana while others seem to limit its spread in Florida (http://www.gsmfc.org/nis/nis/Cichlasoma_cyanoguttatum.html).”

References (includes journals, agency/university reports, and internet links):

1. http://nas.er.usgs.gov/fishes/accounts/cichlida/ci_cyano.html. USGS Nonindigenous Aquatic Species.
2. http://www.gsmfc.org/nis/nis/Cichlasoma_cyanoguttatum.html. Gulf of Mexico program Non-indigenous species profiles.
3. Hubbs, C., T. Lucier, G.P. Garrett, R.J. Edwards, S.M. Dean, and E. Marsh. 1978. Survival and abundance of introduced fishes near San Antonio, Texas. Texas Journal of Science 30(4):369-376.
4. Conkel, D. 1993. Cichlids of North and Central America. Tropical Fish Hobbyist Publications, Inc., Neptune City, NJ.
5. Page, L. M., and B. M. Burr. 1991. A field guide to freshwater fishes of North America north of Mexico. The Peterson Field Guide Series, volume 42. Houghton Mifflin Company, Boston, MA. 432 pp.
6. Brown, W.H. 1953. Introduced fish species of the Guadalupe River Basin. The Texas Journal of Science 5(2):245-251.
7. Itzkowitz, M., and J. Nyby. 1982. Field observations of parental behavior of the Texas cichlid *Cichlasoma cyanoguttatum*. The American Midland Naturalist 108(2):364-368.
8. Lee, D. S., C. R. Gilbert, C. H. Hocutt, R. E. Jenkins, D. E. McAllister, and J. R. Stauffer, Jr. 1980 et seq. Atlas of North American freshwater fishes. North Carolina State Museum of Natural History, Raleigh, NC.
9. Courtenay, W.R., Jr., H.F. Sahlman, W.W. Miley, II, and D.J. Herrema. 1974. Exotic fishes in fresh and brackish waters of Florida. Biological Conservation 6(4): 292-302.
10. Shafland, P.L. 1996. Exotic fishes of Florida- 1994. Reviews in Fisheries Science 4(2):101-122.

Available Mapping Information:

1. USGS Nonindigenous Aquatic Species. http://nas.er.usgs.gov/fishes/accounts/cichlida/ci_cyano.html
2. Gulf of Mexico program Non-indigenous species profiles. Historical Distribution of *Cichlasoma cynoguttatum* in Non-Native Range http://www.gsmfc.org/nis/nis/nrange/Cichlasoma_cyanoguttatum_non-native_range.html